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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,578	09/27/2006	Hong Gil Nam	Q97444	2049
23373 7590 12/23/2008 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037				
EXAMINER				
BAUM, STUART F				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/594,578

**Applicant(s)**

NAM ET AL.

**Examiner**

STUART F. BAUM

**Art Unit**

1638

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 September 2006.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-9 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 27 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-85/86)  
Paper No(s)/Mail Date 9/27/2006  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☒ Other: sequence search results

### **DETAILED ACTION**

1. Claims 1-9 are pending and are examined in the present office action, including SEQ ID NO:1 encoding SEQ ID NO:2.

### ***Specification***

2. The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See for example pages 5, 8 and 9. See MPEP § 608.01.

### ***Information Disclosure Statement***

3. The information disclosure statement filed 9/27/2006 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

### ***Claim Objection***

4. Claim 2 is objected to for reciting "A DNA encoding" instead of --A DNA molecule encoding--.

Claim 7, line 2 is objected to for reciting "the plant" instead of --a plant--.

***Enablement***

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-9 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claimed invention is not supported by an enabling disclosure taking into account the *Wands* factors. *In re Wands*, 858/F.2d 731, 8 USPQ2d 1400 (Fed. Cir. 1988). *In re Wands* lists a number of factors for determining whether or not undue experimentation would be required by one skilled in the art to make and/or use the invention. These factors are: the quantity of experimentation necessary, the amount of direction or guidance presented, the presence or absence of working examples of the invention, the nature of the invention, the state of the prior art, the relative skill of those in the art, the predictability or unpredictability of the art, and the breadth of the claim.

The claims are drawn to a flowering time controlling protein, COG2, having the amino acid sequence of SEQ ID NO:2, a DNA molecule encoding said protein, or wherein the DNA molecule has the nucleotide sequence of SEQ ID NO:1, an expression vector comprising the DNA molecule or microorganism or plant transformed with said vector, or a method for

controlling the flowering time of a plant comprising transforming a plant with said DNA molecule.

Applicants isolated their invention by looking for a sequence in the NCBI database that was similar to that of a known flowering time controlling gene of Arabidopsis, COG (page 8, Example 1). Applicants screened a genomic Arabidopsis library using PCR primers and amplified out a sequenced having the nucleotide sequence of SEQ ID NO:1, which showed 78% homology with the nucleotide sequence of the COG gene of SEQ ID NO:3 (page 8, bottom paragraph). The protein encoded by SEQ ID NO:1, i.e., SEQ ID NO:2, displays 77% homology with the COG protein of SEQ ID NO:4 (page 9, top paragraph). The gene of SEQ ID NO:1 is designated COG2 gene. Applicants disclose the COG2 protein contains a DOF domain (DNA binding with One Finger). Applicants disclose subcloning the COG2 gene into the pCambia 3301 vector which was transformed into Arabidopsis (page 9, Example 2). Applicants disclose 30% of the COG2 transformants exhibited a delayed flowering phenotype (page 10, top paragraph) and the plants that had a delayed flowering phenotype also produced more rosette leaves compared to wild type plants (page 12, top paragraph).

Applicants have not provided an enabling disclosure for the claimed invention. Applicants' claims are drawn to the nucleic acid of claim 2, but Applicants do not indicate that the nucleic acid is operably linked to a promoter. Transforming plants with a nucleic acid that is just a coding region of a protein will not produce the desired phenotype, because the nucleic acid will not be expressed in the desired cell, tissue, or organ at the correct developmental time. Expression of the nucleic acid will depend where in the genome the nucleic acid is integrated. To be expressed correctly, the nucleic acid must integrate in frame, and within a region that is

within close proximity to a promoter, a promoter whose spatial and temporal expression matches Applicants' needs. The Office contends that the specification is devoid of any discussion pertaining to promoters that can be used to produce the desired result. Therefore, one skilled in the art would not be apprised of the correct expression pattern that is required to achieve the desired outcome.

The Office contends the recitation "controlling the flowering time of a plant" encompasses many phenotypes, e.g., delay flowering or accelerating flowering. Applicants have only disclosed plants that have a delayed flowering time. Applicants have not shown that knocking out the COG2 gene produces a plant with an accelerated flowering phenotype. Therefore, Applicants are not enabled for claims drawn to a method for controlling the flowering time of a plant.

In the absence of guidance, undue trial and error experimentation would be required for one of ordinary skill in the art to screen through the multitude of plants that are transformed with the claimed sequence and to find those whose flowering time is delayed and then isolate the DNA that is 5' and 3' of the introduced DNA sequence of SEQ ID NO:1 and operably link the isolated DNA to the DNA of SEQ ID NO:1 followed by transforming and screening plants, in order to identify those, if any, that when over-expressed have a delayed phenotype.

Therefore, given the breadth of the claims; the lack of guidance and examples; the unpredictability in the art; and the state-of-the-art as discussed above, undue experimentation would be required to practice the claimed invention, and therefore the invention is not enabled.

***Claim Rejections - 35 USC § 102***

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Cheuk et al (2003, NCBI Accession Number BT010496).

The claims are drawn to a flowering time controlling protein having the amino acid sequence of SEQ ID NO:2, a DNA molecule encoding said protein, or wherein the DNA molecule has the nucleotide sequence of SEQ ID NO:1, an expression vector comprising the DNA molecule or microorganism transformed with said vector.

Cheuk et al disclose a nucleic acid sequence that exhibits 100% identity with Applicants' SEQ ID NO:1 (sequence search result included), wherein the nucleic acid sequence encodes Applicants' SEQ ID NO:2. The Office contends that for purposes of molecular biology the nucleic acid sequence of Cheuk et al would be in a vector and transformed into a microorganism, and as such, Cheuk et al anticipate the claimed invention.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Jiang et al (2003, U.S. Patent Number 7,196,245 B2).

The claims are drawn to a flowering time controlling protein having the amino acid sequence of SEQ ID NO:2, a DNA molecule encoding said protein, or wherein the DNA molecule has the nucleotide sequence of SEQ ID NO:1, an expression vector comprising the

DNA molecule or microorganism transformed with said vector, or method for controlling the flowering time of a plant comprising transforming a plant with said DNA molecule, or wherein the plant is Arabidopsis.

Jiang et al disclose a protein of SEQ ID NO:1412 which exhibits 99.4% sequence identity with Applicants' SEQ ID NO:2 (sequence search results included). Jiang et al also disclose a nucleotide sequence of SEQ ID NO:1411 that encodes SEQ ID NO:1412, wherein SEQ ID NO:1411 exhibits 99.8% sequence identity with Applicants' SEQ ID NO:1 (sequence search result included). Jiang et al disclose an expression vector comprising the nucleotide sequence (column 13, lines 24-28) and a plant transformed with the nucleotide sequence (column 12, lines 45-49). Jiang et al also disclose a method for producing a transgenic plant comprising transforming a plant with said nucleotide sequence. In addition, Jiang et al disclose that a paralog of SEQ ID NO:1412, i.e., SEQ ID NO:402 also named G2432 (columns 491-492), when transformed into a plant produces a plant with delayed flowering (column 587, lines 15-41). Therefore, the Office contends transforming a plant with SEQ ID NO:1411 would also produce a plant that has a delayed flowering. The Office contends the difference between Applicants' SEQ ID NO:1 and Jiang et al's SEQ ID NO:1411 is a single base difference which is probably due to sequencing errors given that both sequences were isolated from Arabidopsis, and the one base difference accounts for the one amino acid difference between Applicants' SEQ ID NO:2 and Jiang et al's SEQ ID NO:1412. For purposes of molecular biology, the sequence of Jiang et al would be in a vector and transformed into a microorganism, and as such, Jiang et al anticipate the claimed invention.



8. No claims are allowed.
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stuart F. Baum whose telephone number is 571-272-0792. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached at 571-272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Stuart F. Baum/  
Stuart F. Baum Ph.D.  
Primary Examiner  
Art Unit 1638  
December 11, 2008